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National Cooperative Dairy Herd Improvement Program

RECORD BOOK

A plan for every size herd

STANDARD DHIA OWNER SAMPLER WEIGH-A-DAY-A-MONTH

AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

ARS-44-116

Dairy-Herd-Improvement Letter (Vol. 38, No. 4)

APRIL 1962

NEW DHIA SIRE RECORD

The dam-and-daughter comparison proved-sire record is being replaced by a new sire record to be designated --

"USDA-DHIA SIRE SUMMARY RECORD"

The new sire summary record consists of daughter-herdmate comparisons to evaluate the breeding worth of DHIA sires.

For sires in natural service the sire summary record will include a summary of the records of the daughters of a sire and their herdmates and a listing of the daughters of the sire whose records were used in the tabulation. The difference in level of production of each daughter from the average of her herdmates, adjusted for numbers, will also be listed.

For sires in AI (artificial insemination) service the sire summary record will include a summary of the records of the daughters of the sire and their herdmates and a Regressed-Adjusted Daughter Average, which is an estimate of the production level of future daughters of the sire. In addition, milk-production records of registered daughters that exceed the average of their herdmates by a specified amount will be listed in the AI sire summary record.

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Issued May 1962

HOW TO INTERPRET THE USDA-DHIA SIRE SUMMARY RECORD (DHIA-1202)

The basic idea of the herdmate or contemporary comparison is that a sire can be judged by comparing his daughters' production to the production of other sire progeny groups which were fed and managed under the same conditions. This means subtracting from each daughter's record the average production of all paternally unrelated cows that freshened in the same herd and in the same year and season as that daughter.

Available information indicates that the reliability of evaluating bulls by this procedure can be increased by considering the following factors for each sire: (1) the number of herdmates that each daughter has, (2) the number of daughters of the sire, and (3) the average production level of the herd or herds in which the sire's daughters made their records.

Evaluation of Sires in Natural Service

The first way in which the reliability of sire evaluation can be increased is to place sires on a comparable basis with respect to the average number of herdmates per daughter. This is done by making the following calculation for each record of a daughter of the sire:

$$\text{Breed Season Av.} + \frac{M}{M+1}\,(\text{Herdmate Av.} - \text{Breed Season Av.})$$

where M stands for the number of herdmates.

The effect of this procedure is to place more reliance on herdmate averages for a large number of cows than on averages for a few cows.

The average of this corrected herdmate average for all daughters of the sire is obtained. This value is listed on the accompanying example summaries under the column headed "Adjusted Herdmate Average." For example, the Adjusted Herdmate Average for the registered Holstein sire 1094897 is 13,466 pounds of milk and 466 pounds of butterfat.

Sires in natural service will be evaluated on the basis of the difference between the average production of the sire's daughters and the Adjusted Herdmate Average. In the example summary for sire 1094897, this difference was plus 429 pounds of milk and minus 12 pounds of fat.

Evaluation of Sires in Artificial Service

Reliability in comparing the transmitting ability of sires can be further increased by considering the number of daughters that each bull has and the relative production levels of the herds in which the daughters made their records. At present this can be done only for sires in artificial service.

The fact that some sires are used in better herds than others can be accounted for as follows:

Adjusted Daughter Av. = Daughter Av. - Adjusted Herdmade Av.
+0.1 (Adjusted Herdmate Av. - Breed Av.) + Breed Av.

By making this calculation for each sire, the summary of sires used in good herds is increased and the summary of sires used in poor herds is decreased.

Since the reliability of the evaluation increases as the number of daughters that a sire has increases, a means of placing sires on a standard basis for number of progeny is needed. This can be achieved in the following way:

$$\text{Breed Av.} + \frac{N}{N + 12} \text{ (Adjusted Daughter Av. - Breed Av.)}$$

where N stands for the number of daughters.

This measure is an estimate of breeding value, since it is the expected production average of a large group of future daughters to be sired by the bull. This is the measure of transmitting ability to be given for AI sires in the USDA-DHIA Sire Summary Record. In the accompanying summary for AI sire 1083919, this value is listed under the column headed "Predicted Average." The estimate of transmitting ability for this sire is 12, 266 pounds of milk and 431 pounds of fat.

Since the "Predicted Average" places sires on a comparable basis with respect to herdmate numbers, number of daughters, and herd production levels, it should always be used in ranking a group of AI sires.

Daughter Listing

The new Sire Summary Record will list the production of individual daughters. All daughters of natural service sires will be listed as indicated in the accompanying example summary of sire 1094897.

The daughters of AI sires will be screened according to the amount they exceed their herdmates' production. The difference between the daughter's production and that of her herdmates, weighted in proportion to the number of records that the daughter has, will be calculated. This is the value listed under the column headed "WTD DIFF" (weighted difference) in the accompanying example summary. All daughters of AI sires whose "WTD DIFF" value for milk exceeds a specified amount will be listed. For example, daughters of Holstein sires with a "WTD DIFF" value of milk greater than 3,000 pounds will be listed.

The screening process will result in listing approximately seven percent of the cows resulting from AI Service. In the example for AI sire 1083919, two daughters met the requirement for listing.

These listings have two uses: (1) for natural service sires, the "WTD DIFF" value can be used to rank the daughters of a bull according to their breeding value for selection purposes; (2) for AI sires, the daughters listed will identify superior brood cows for planned matings to produce sire prospects.

USDA-DHIA SIRE SUMMARY RECORD FOR HOLSTEIN (BREED)

U. S. DEPT. OF AGRICULTURE - AGRICULTURAL RESEARCH SERVICE
ANIMAL HUSBANDRY RESEARCH DIVISION DAIRY CATTLE RESEARCH BRANCH

1094897 SUMMIT LAD OF ELMDALE..... RECORDS FROM STATER 41-012

(SIRE NUMBER) (NAME)

BORN 09-19-49 SIRE. 001005201 DAM. 002838533

AI SERVICE TABULATED 08-29-61 PREVIOUS TABULATION. 03-56

SUMMARY	IDENTIFICATION OF DAUGHTERS OF SIRE							AVERAGE RECORDS OF DAUGHTERS OF SIRE						ADJUSTED HERD MATES AVERAGE			PREDICTED AVERAGE	
	AI	DAUGHTER NUMBER	DAM NUMBER	BREED	DATE OF BIRTH MO.	DA.	YR.	DAYS IN MILK NUMBER	RECORDS AVERAGED NUMBER	MILK POUNDS	FAT PERCENT	FAT POUNDS	CAR	RECORDS NUMBER	MILK POUNDS	FAT POUNDS	MILK POUNDS	FAT POUNDS
12 NON-AI DAU									36	13895	3.3	454						
12 DAU WITH HERD MATES									36	13895	3.3	454		19	13466	466		
														DIFF.	429	12-		
HERD CODE																	WTD. DIFF.	
41660053		3467550	2653204	3	10	23	51	305	2	13165	4.0	528		13	14627	517	2018-	15
41660057		3646955	2802735	3	11	25	52	305	2	12100	3.7	443		22	12826	434	1002-	12
41660057		3492303	2802736	3	11	14	51	305	1	11250	3.5	393		7	13361	435	2111-	42-
41660057		3492301	2802738	3	10	28	51	297	4	14640	3.3	487		6	13871	464	1307	39
41660057		3608738	2802738	3	09	25	52	303	3	15190	3.1	476		24	13031	452	3411	38
41660057		3608734	2926178	3	08	20	52	288	3	13480	3.4	463		24	13031	452	709	17
41660057		3492302	2926180	3	11	11	51	285	2	15250	3.4	523		9	13877	466	1895	79
41660057		3467551	2949240	3	10	25	51	305	6	13447	3.1	423		18	14246	439	1422-	28-
41669057		3793625	3178445	3	09	19	53	301	4	15570	2.8	437		20	13304	517	3852	136-
41660057		3608733	3178448	3	08	07	52	305	2	15450	2.9	450		24	13031	452	3338	3-
41669057		3793624	3284618	3	09	04	53	305	4	13715	3.3	450		20	13304	517	699	114-
41660057		3646956	3307190	3	12	05	52	298	3	13490	2.8	380		38	13090	441	632	96-

USDA-DHIA SIRE SUMMARY RECORD FOR HOLSTEIN (BREED)

U. S. DEPT. OF AGRICULTURE · AGRICULTURAL RESEARCH SERVICE
ANIMAL HUSBANDRY RESEARCH DIVISION · DAIRY CATTLE RESEARCH BRANCH

1083919 WINDY HILL GOVERNOR..... RECORDS FROM STATES 16-012

(SIRE NUMBER) (NAME)

BORN. 10-24-49 SIRE. 000784231 DAM. 003106061

AI SERVICE 16-002 TABULATED 08-29-61 PREVIOUS TABULATION. 11-56

SUMMARY	IDENTIFICATION OF DAUGHTERS OF SIRE							AVERAGE RECORDS OF DAUGHTERS OF SIRE						ADJUSTED HERD-MATES AVERAGE			PREDICTED AVERAGE	
	AI	DAUGHTER NUMBER	DAM NUMBER	DAM BREED	DATE OF BIRTH MO.	DA.	YR.	DAYS IN MILK NUMBER	RECORDS AVERAGED NUMBER	MILK POUNDS	FAT PERCENT	FAT POUNDS	CAR	RECORDS NUMBER	MILK POUNDS	FAT POUNDS	MILK POUNDS	FAT POUNDS
10 AI DAUGHTERS									31	11116	3.5	387						
7 DAU WITH HERD MATES									25	11275	3.4	387		8	10667	418		
														DIFF.	608	31-	12266	431
12 NON-AI DAU									38	12785	3.4	437						
8 DAU WITH HERD MATES									10	14838	3.4	504		14	12776	434		
														DIFF.	2062	70		
HERD CODE																	WTD.	DIFF.
16120042	A	4232674	2976234	3	01	16	56	305	1	15270	4.0	607		7	11960	454	3310	153
16590071		4000003	3410000	3	07	04	58	305	1	14150	3.4	476		2	10955	383	3195	93

Growth Through Agricultural Progress